

AMENDMENTS TO THE CLAIMS

Please amend Claim 1.

1. (Currently amended) A method for forming copper interconnection conductors for interconnecting integrated circuits on a substrate, comprising:

providing an insulation layer having a damascene trench therein on a substrate, the damascene trench including sidewalls;

forming a barrier layer using ruthenium (Ru) or rhenium (Re) or their alloys directly on a surface ~~surfaces~~ of an ~~the~~ insulation layer including the sidewalls within the damascene trench on said substrate using an atomic layer deposition (ALD) method; and

forming a copper layer ~~directly~~ on said barrier layer using chemical vapor deposition (CVD) such that the barrier layer intervenes between the copper layer and the sidewalls of the damascene trench within the insulation layer.

2. (Previously Presented) The method of claim 1, wherein said barrier layer is formed of a ruthenium (Ru) alloy having an atomic ratio of at least 50% or more ruthenium (Ru).

3. (Previously Presented) The method of claim 1, wherein said atomic layer deposition method is a plasma-enhanced atomic layer deposition (PEALD) method.

4. (Canceled)

5. (Previously Presented) The method of claim 1, wherein forming said copper layer comprises using iodine or an iodine compound as a catalyst for CVD.

6. (Previously Presented) The method of claim 1, wherein forming said copper layer further comprises using an electroplating method.

7. (Previously Presented) The method of claim 6, wherein forming said copper layer comprises sequentially using CVD followed by the electroplating method.

8. (Canceled)

9. (Previously Presented) The method of claim 1, wherein said barrier layer is formed of a rhenium alloy having an atomic ratio of at least 50% or more rhenium.

10.-20. (Canceled)

21. (Previously Presented) The method of claim 1, wherein using CVD comprises using a fluorine-containing copper precursor.

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22. (Previously Presented) The method of claim 1, wherein using CVD comprises using a carbon-containing copper precursor.

23. (Previously Presented) The method of claim 1, wherein using CVD comprises using a copper precursor comprising hexafluoroacetylacetonate (hfac).

24. (Previously Presented) The method of claim 23, wherein said copper precursor includes (hexafluoroacetylacetonate)Cu(vinyltrimethylsilane), or (hfac)Cu(vtms).

25.-28. (Canceled)